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September 17, 1986

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: LaSalle County Station Unit 1
Pump and Valve Inservice Testing Plan
NRC Docket No. 50-373

Reference (a): Letter dated May 27, 1986 from E. G. Adensam to D. L. Farrar.

Dear Mr. Denton:

Reference (a) transmitted the results of your staff review of the LaSalle Unit 1 Pump and Valve Inservice Testing Plan. Included in that tranmsittal was a Safety Evaluation Summary which included findings regarding relief Commonwealth Edison (CECo) requested from the testing requirements of ASME Section XI. Also included was a Safety Evaluation Report, Pump and Valve Testing Program, LaSalle Unit 1, Docket No. 50-373.

The Safety Evaluation Report and Summary have been reviewed and the findings evaluated for incorporation into the LaSalle Unit 1 IST Program. The majority of the findings are being incorporated into the program as written. However, alternative methods of accomplishing the intent of the requirements are proposed for two of the findings and part of a third. These proposals and discussion of why they were found to be impractical are addressed in the enclosure.

We would appreciate the opportunity to discuss any of these proposals at length with your staff.

Please direct any additional questions you may have regarding this matter to this office.

Very truly yours,

C M Allen

C. M. Allen
Nuclear Licensing Administrator

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cc: Dr. A. Bournia - NRR
Resident Inspector - LSCS

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FINDING 1:

Relief has been granted from measuring only displacement vibration amplitude, as required by ASME Section XI, Article IWP-3100, and IWP-4500 for all pumps in the IST Program. However, the NRC does not feel that the IRD Mechanalysis Limits proposed by LaSalle are adequate to ensure proper corrective actions are taken should pump degradation occur, and have proposed alternate acceptance criteria.

The Technical Staff of LaSalle along with CECo's System Material Analysis Department's (SMAD) Vibration Group has reviewed the alternate acceptance criteria proposed by the NRC for vibration velocity measurement limits along with other approaches to vibration testing and acceptance criteria.

As a result of this review, LaSalle Station would like to propose, as an alternative, that the vibration testing requirements given in ANSI/ASME OM-6, Draft 8 be used in lieu of those given in the Safety Evaluation Report (SER). The testing requirements in this document were examined along with other testing methodology currently in use at other facilities. Based on the monitoring instrumentation and pump installation at LaSalle, this methodology was selected as most appropriate for our configuration.

With this in view, LaSalle plans to resubmit Relief Request RP-04, with all additional vibration monitoring requirements of ANSI/ASME OM-6, Draft 8 incorporated. The acceptance ranges for pump vibration will be implemented following NRC approval of the relief request. A draft of Relief Request RP-04 is provided as Attachment 1.

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FINDING 2:

In the Safety Evaluation Report (Reference (a)) the NRC denied relief as requested in RP-05, and stated that the Diesel Oil system must be modified to meet ASME Section XI testing requirements. Analysis of the system for modifications to provide instrumentation to meet ASME requirements, determined that the test parameters can be measured with the existing configuration as indicated below. Therefore, the affected surveillance procedures will be revised to incorporate the necessary changes to meet ASME Section XI requirements.

The following information is provided to describe how each of the test parameters will be measured or determined:

Pump Inlet Pressure - This test parameter will be determined by converting the Diesel Fuel Oil Storage Tank (DFOST) level into a static pressure head in psig for the pump.

Pump Differential Pressure - This test paramter will be determined by recording the pump discharge pressure and subtracting off the running inlet pressure. Running inlet pressure is calculated by subtracting the suction strainer differential pressure, when the pump is operating, from the static pump inlet pressure. Calculations have determined that the friction head loss resulting from the approximate 8 foot section of suction piping is negligible.

Pump Flow Rate - This test parameter will be calculated using the Diesel Fuel Oil Day Tank level indicator as the flow rate quantity meter as permitted in IWP-4600, and converting the measured rate of change to flow rate in GPM.

In summary, relief from the requirements of ASME Section XI will not be requested and RP-05 will be deleted. An Inservice Test will be run on each Diesel Fuel Oil Transfer Pump to obtain new base line data for establishing new reference values, and applicable procedures will be revised to incorporate the additional test parameter measurements and acceptance ranges.

FINDING 3:

Based upon the NRC's position on rapid acting valves the only valves at LaSalle which fall into this category are solenoid valves. Therefore, Relief Request RV-02 will be revised to include only solenoid valves. A draft revised Relief Request RV-02 is included as Attachment 2.

FINDING 4:

Per the Safety Evaluation Report, the IST Program for Unit 1 will be revised to include the following full-flow test valves: HPCS - 1E22-F010, 1E22-F011, 1E22-F023; LPCS - 1E21-F012; RHR - 1E12-F021; RCIC - 1E51-F022 and 1E51-F059 as listed below.

Valve No.	Size	P&ID No.	Coord	Class/ Category	Valve Type	Act. Type	Valve Pos.	Test	Test Schd.	Max Stroke Time	Relief Request	Act or Passive	Remarks
HPCS													
1E22-F010	10	95	D4	2/B	GB	MO	C	FS,ST PIT	Q RR	165	-	A	Test Discharge to CST Upstream Stop
1E22-F011	10	95	D2	2/B	GB	MO	C	FS,ST PIT	Q RR	165	-	A	Test Disccharge to CST Downstream Stop
1E22-F023	12	95	C4	2/A	GB	MO	C	FS,ST PIT,LT	Q RR	198	RV-19	A	Full Flow Test to SP (See Notes 4,8)
LPCS													
1E21-F012	14	94	C5	2/A	GB	MO	C	FS,ST PIT,LT	Q RR	231	RV-19	A	Full Flow Test to SP (See Note 4)
RHR													
1E12-F021	18	96-3	E5	2/A	GB	MO	C	FS,ST PIT,LT	Q RR	297	RV-19	A	C RHR Pump Full Flow Test Stop to SP (See Notes 4, 6,8)
RCIC													
1E51-F022	4	101-2	D6	2/B	GB	MO	C	FS,ST PIT	Q RR	66	-	A	Full Flow Test Upstream Stop
1E51-F059	4	101-2	D5	2/B	GB	MO	C	FS,ST PIT	Q RR	66	-	A	Full Flow Test Downstream Stop

FINDING 5:

1. Control Rod Drive Charging Water Header Check Valves CRD-115

The Control Rod Drive (CRD) system provides high pressure charging water to the under-piston area of the control rod drive mechanism to scram the reactor when required. If the charging water header pressure is lost, the individual scram accumulators provide a source of energy to perform the scram function. Check valves CRD-115 are located between the accumulators and the charging water header. These check valves maintain the accumulators pressurized following a loss of charging water pressure. If a check valve leaks after charging water pressure is lost, the accumulator pressure could decrease below the pressure required to insert the control rod if the reactor pressure is insufficient to provide a source of high pressure water to accomplish the scram function (Startup and Refueling modes).

There is a concern when the reactor vessel is at less than operating pressure (less than 950 psig), that the control rod drive accumulators do not maintain adequate pressure for a period of time compatible with operator action if no Control Rod Drive Pump is operating (SSER #2, Section 4.6.2). With reactor pressure greater than 950 psig, charging water pressure is not of concern because reactor pressure is sufficient to ensure adequate scran capability.

To ensure that sufficient high pressure water is available for a scram in the Startup and Refueling modes, a reactor trip (SCRAM) on low CRD discharge water header pressure has been designed and installed in Unit 1. This provides for a Control Rod Drive Charging Water Header Low Pressure SCRAM with a trip setpoint of greater than or equal to 1267 psig (allowable value 1185 psig) with a time delay of less than or equal to 10 seconds. This scram will be automatically bypassed when the reactor mode switch is in other than the Startup or Refuel positions (Operational Conditions 2 and 5). The Technical Specification surveillance requirement 4.1.3.5.b.2 to "measure and record the time that each individual accumulator check valve maintains the associated accumulator pressure above the alarm setpoint with no control rod drive pump operating" is no longer required because the worst case leakage rate of the accumulator check valves still provides sufficient pressure to insert the control rods with the charging water header low pressure scram in effect.

Based on NRR review and acceptance of this Technical Specification change, we believe that these valves are not required to be tested and do not need to be added to the IST program as category "C" valves. The Technical Specification change is described in a letter dated February 4, 1986 from EG Adensam to DL Farrar transmitting Amendment 33 to NPF-11 (Attachment 3).

2. Control Rod Drive Charging Water Header Check Valves CRD-138

The control rod drive cooling water header check valves CRD-138 are already functional tested as part of the 10 CFR 50 Appendix J Type A test in that during the test the CRD system is in its post-accident condition (scrammed condition with the pumps off). With the CRD system in this condition any leakage via this pathway would be included in the Type A test results. This testing method meets the requirements of Section 3.1.4 of the SER to test the valves. However, it is impractical to meet the IST requirement as we cannot quantify the leakage via this path or assign the leakage to a particular valve. Therefore, we meet the intent of the SER, but find it impractical to record the data required to meet ASME Section XI.

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FINDING 6:

This relief request has been deleted from the IST Program. "As-Found" relief valve setpoints are verified, and action is taken in accordance with ASME Section XI, Article IWV-3513, and IWV-3514.

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FINDING 7:

REFERENCES:

A) UFSAR Table 6.2-21
B) NUREG 0519 LaSalle County Station SER

The 10 CFR 50 Appendix J program has been previously reviewed and approved in reference (B). The listing of containment isolation valves and their classification is documented in reference (A). This program is described in the Technical Specifications Section 3.6.1.2 and Table 3.6.3-1. In this SER the Staff identified several valves which were either not included in the IST Program or if they were included were not categorized as A or A/C as appropriate. The following action or justification is provided with regards to correctly categorizing these valves in the IST Program.

Valve Number(s)	Action
1E22-F023 1E21-F012 1E12-F021	These valves will be added to the program as category A.
1IN100 1IN101	These valves are category B valves per reference (A) and not included in Tech Spec Table 3.6.3-1, and will be added to the program as such. Refer to note 38 of Reference (A)(Attachment 4).
1CM004 1CM012	These valves will be added to the program as excess flow check valves, category A/C. Refer to Reference (A) footnote 32 (Attachment 4).
1CM022A 1CM024A 1CM025A 1CM021B 1CM023B 1CM026B	These valves are not category A valves, and are presently in the program as category B. Refer to reference (A) note 40 and Tech Spec Table 3.6.3-1 footnote (H). In reference (A) valve 1CM021B "Through Line Leakage" classification is a typo and will be corrected in the next update of the UFSAR.
1E12-F099A 1E12-F099B	These valves will be added to the program as category A. However, they are not leak tested in accordance with Appendix J. Refer to Technical Specification Table 3.6.3-1 footnote (g).

The IST Program for Unit 1 will be revised as follows:

FINDING: 7 (Continued)

Valve No.	Size	P&ID No.	Coord	Class/ Category	Valve Type	Act. Type	Valve Pos.	Test	Test Schd.	Max Stroke Time	Relief Request	Act or Passive	Remarks
CM													
1CM004	.75	92-2	B3	2/ A/C	EFC		O	E,LT	RR		RV-34	A	LP Excess Flow (See Note 9)
1CM012	.75	92-2	C6	2/ A/C	EFC		O	E,LT	RR		RV-34	A	LP Excess Flow (See Note 9)
IN													
1IN100	1	66-7	C7	2/B	GB	SO	O	FS,ST PIT,FST	RR RR	5	RV-02 RV-12	A	South Side N2 to DW Isolation
1IN101	1	66-7	C6	2/B	GB	SO	O	FS,ST PIT,FST	RR RR	5	RV-02 RV-12	A	North Side N2 to DW Isolation
HPCS													
1E22-F023	12	95	C4	2/A	GB	MO	C	FS,ST PIT,LT	Q RR	198	RV-19	A	Full Flow Test to SP (See Notes 4,8)
LPCS													
1E21-F012	14	94	C5	2/A	GB	MO	C	FS,ST PIT,LT	Q RR	231	RV-19	A	Full Flow Test to SP (See Note 4)
RHR													
1E12-F021	18	96-3	E5	2/A	GB	MO	C	FS,ST PIT,LT	Q RR	297	RV-19	A	C RHR Pump Full Flow Test Stop to SP (See Notes 4, 6,8)
1E12-F099A	2	96-1	C7	1/A	GB	MO	C	FS,ST PIT,LT	CS RR	30	RV-04	A	RHR S/D Cooling Loop Testable CK Bypass Stop (See Notes 1,5)(M-8)
1E12-F099B	2	96-2	C7	1/A	GB	MO	C	FS,ST PIT,LT	CS RR	30	RV-04	A	RHR S/D Cooling Loop Testable CK Bypass Stop (See Notes 1,5)(M-9)

ATTACHMENT 1

Relief Request: RP-04 (Draft 1)

Affected Component(s):

Component EPN	Class/Category	Function
All Pumps	N/A	N/A

ASME Section XI Test Requirement:

IWP-3100 Inservice Test Procedure; IWP-4500 Vibration - For measuring vibration amplitude.

Basis for Relief:

Relief is requested from the requirements of measuring vibration amplitude. A far more informative reading is obtained using vibration velocity equipment because it accounts for both displacement and rate of frequency. Therefore, it is more advantageous to measure vibration velocity than vibration amplitude displacement for determining the mechanical condition of a pump.

Alternative Testing:

The alternative testing described herein for pump vibration monitoring was developed using ANSI/ASME OM-6 (Draft 8) as a guideline, with the intent of incorporating into the program any additional vibration testing requirements of OM-6 to those found in ASME Section XI.

Pump vibration measurements are obtained and recorded in velocity (inches per second), and are broadband (unfiltered) peak readings. All monitored locations are clearly marked to identify the specific point at which the transducer is to be placed while taking vibration measurements using portable equipment. The readout system and transducers used to take vibration measurements are capable of frequency response in the range of one-third minimum pump speed to at least one-thousand hertz, and they meet the minimum accuracy requirement over that range of +/-5%.

All centrifugal pumps in the program will have vibration measurements taken in a plane approximately perpendicular to the rotating shaft in two orthogonal directions on each accessible pump bearing housing. Measurement will also be taken in the axial direction on all bearing housings when accessible. Reciprocating pumps will have vibration measurements taken approximately perpendicular to the crankshaft and the line of plunger travel, including the axial direction when accessible on each pump bearing housing.

The acceptable, alert, and required action ranges of ANSI/ASME OM-6 (Draft 8), Table 6100-1 will be used in lieu of Table 3100-1 of Section XI as shown below. Corrective actions will be taken in accordance with article IWV-3230.

Ranges of Vibration

Pump Type	Alert Range Low	Alert Range High	Required Action Range
Centrifugal	2.5V(ref)	6V(ref)	6V(ref)
	But not > 0.325 in/sec		But not > 0.70 in/sec.
Reciprocating	2.5V(ref)	6V(ref)	6V(ref)

Notes 1: V (ref) is the reference velocity in inches per second.

2: Any vibration measurement value below the low alert range is acceptable.

ATTACHMENT 2

Relief Request: RV-02

Affected Component(s):

Component EPN	Class/Category	Function
All solenoid valves required to be stroke time tested, and normally stroking in less than 2 seconds.	2/A & B	Various

ASME SECT XI Test Requirement:

Set alert range limits in accordance with subarticle IWV-3417(a).

Basis for Relief:

Setting the alert range in accordance with IWV-3417(a) for solenoid valves which stroke in less than 2 seconds, will many times lead to increased frequency testing and/or possible maintenance activities when these actions are not reasonably warranted. This is due to the relatively larger error introduced when timing the stroke of these rapid-acting valves. Therefore, relief is requested from the 50% increased frequency testing requirement of IWV-3417(a) for solenoid valves which normally stroke in less than 2 seconds.

Alternative Testing:

Set the alert range for solenoid valves at 2 seconds. When the stroke time exceeds 2 seconds they will be put on monthly testing until corrective action can be taken in accordance with IWV-3417. The stroke times of these valves will not be included in the Trend Analysis Program.